NON-PUBLIC?: N
ACCESSION #: 8904070151

LICENSEE EVENT REPORT (LER)

FACILITY NAME: River Bend Station PAGE: 1 of 3

DOCKET NUMBER: 05000458

TITLE: Relay Failure Causing Generator Trip With Reactor Scram and High Pressure Core Spray and Reactor Core Isolation System Injections
EVENT DATE: 02/25/89 LER #: 89-008-00 REPORT DATE: 03/27/89

OPERATING MODE: 1 POWER LEVEL: 078

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: L. A. England, Director-Nuclear Licensing TELEPHONE: 504-381-4145

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE TO NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

At 0041 on 2/25/89 with the unit at 78 percent power (Operational Condition 1), the reactor automatically scrammed while performing a routine upper thrust bearing wear detector test in accordance with Operations Section Procedure (OSP)-0101. The scram occurred as a result of a turbine trip caused by a defective bypass relay. The relay failed to open the "Trip Bus" circuit as designed to prevent a turbine trip while testing the thrust bearing wear detector.

Immediately following the turbine trip, the reactor core isolation cooling (RCIC) system in
ected due to a spurious low reactor water, level 2 signal.
The spurious signal resulted from a pressure perturbation, caused by the fast closure of the turbine control valves, being sensed by the reactor water level instrumentation. Reactor water level increased to Level 8 and the RCIC steam supply valve closed per design.

As corrective action, a turbine trip bypass switch will be installed to be utilized during the weekly turbine testing to temporarily bypass turbine trips which may be inadvertently caused by spurious relay actuations within the main turbine electro-hydraulic control panel. Additional corrective action is being implemented during the second refueling outage to prevent spurious RCIC initiations.

There was no adverse impact on the safe operation of the plant or to the health and safety of the public as a result of this event since the reactor scram placed the unit in the safe shutdown condition.

END OF ABSTRACT

At 0041 on 2/25/89 with the unit at 78 percent power (Operational Condition 1), the reactor (*RCT*) automatically scrammed while performing a routine main turbine upper thrust bearing wear detector test in accordance with Operations Section Procedure (OSP) -0101, "Turbine Generator Periodic Testing". The reactor scram occurred as a result of a turbine (*TRB*) trip caused by a defective bypass relay in the main turbine electro hydraulic control (*HCU*) (EHC) circuit. Immediately following the turbine trip, the reactor core isolation cooling (*DN*) (RCIC) system injected. Reactor water level increased to Level 8 and the RCIC steam supply valve closed per design. This incident is being reported pursuant to 10CFR50.73 (a) (2) (iv).

INVESTIGATION

When performing the main turbine thrust bearing wear detector test, relay K15 is designed to energize and open the "Trip Bus" circuit to prevent a turbine trip while testing the thrust bearing wear detector. However, during this event, contact 1 of the K15 relay did not open to provide the trip bypass and permitted the turbine to trip upon energization of the thrust bearing wear detector circuit. Relay K15 and Relay Kll (which actuates to energize K15) were replaced. Testing prior to and subsequent to replacement of the relays did not duplicate the problem.

An investigation into the cause of the RCIC initiation determined the source of the initiation signal to be a spurious hydraulic perturbation in the reactor water level instrumentation and not an actual Low Level 2 signal. A review of wide range reactor water level emergency response information system (ERIS) computer points on instrument channels B21N091A & B (RCIC) and B21N073C & D high pressure core spray (*BG*) (HPCS) system indicated water level magnitudes of -29, -12, -10, and -3 inches, respectively.

A review of previously reported LER's indicates that there have been no other

turbine trips which resulted from failed relays during turbine testing. However, similar events were experienced on 8-25-88 and 9-6-88 and were previously reported in LERs 88-018 and 88-021 where both HPCS and RCIC initiated due to a hydraulic perturbation in the reactor water level instrumentation. The hydraulic perturbations have been determined to be caused from the turbine control valve fast closure operation inducing a pressure spike in the reactor steam dome following a turbine trip. The pressure spike was immediately transmitted to the four reactor level reference lines located near the top of the reactor but not immediately sensed by the variable lines located lower on the reactor.

Rosemont (*R369*) series transmitters are used to monitor reactor vessel water Levels 1, 2, and 8 on wide range water level instrumentation (-160" to + 60"). This series of transmitter has a mean response time of .059 seconds and no signal dampening feature. Although a true reactor water Level 2 signal was not reached, a spurious trip signal was initiated due to the fast acting 1154 transmitter sensing a high differential pressure across the instrument taps during the pressure transient cause by the turbine trip and subsequent reactor scram.

CORRECTIVE ACTION

Due to the high risk of a turbine trip during the performance of OSP-0101, Operations has suspended the performance of this non-Technical Specification required test until after the second refueling outage at which time a proposed modification (MR 89-0046) can be made to the trip bypass circuit. This modification will install a turbine trip bypass switch on the main turbine EHC Panel 1HI3-P821. The switch will be utilized during the weekly turbine testing to temporarily bypass turbine trips which may be inadvertently caused by spurious relay actuations within the EHC panel.

As interim corrective action to minimize the spurious trips of the 1154 transmitters, MR 88-0284 had been initiated to install a 680 mu F capacitor on the HPCS and RCIC master trip units (B21*N691A, B, E, F, and B12*N673C, G, L, and R). At the time of the subject event, implementation of MR 88-0284 had been completed for the HPCS trip units but not for the RCIC trip units. The completion of the capacitor installation on the HPCS trip units explains why a RCIC initiation was received without a HPCS initiation following this reactor scram.

As final corrective action to prevent spurious HPCS and RCIC initiations, MR 89-0009 is scheduled to be implemented during the second refueling outage. This modification installs a qualified dampening circuit into the 1154 series reactor water level transmitters to prevent the spurious actuations.

SAFETY ASSESSMENT

There was no adverse impact on the safe operation of the plant or the health and safety of the public as a result of this event since the reactor scram placed the unit in the safe shutdown condition. The RCIC system initiation, while unnecessary, did function properly to provide reactor water makeup. All other automatic safety system actions performed as designed.

NOTE: Energy Industry Identification System Codes are identified in the text as (*XX*).

ATTACHMENT 1 TO 8904070151 PAGE 1 OF 1

GULF STATES UTILITIES COMPANY

RIVER BEND STATION POST OFFICE BOX 220 ST. FRANCISVILLE, LOUISIANA 70775

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U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Gentlemen:

River Bend Station - Unit 1
Docket No. 50-458

Please find enclosed Licensee Event Report No. 89-008 for River Bend Station - Unit 1. This report is being submitted pursuant to 10CFR50.73.

Sincerely,

J. E. Booker
Manager-River Bend Oversight
River Bend Nuclear Group

JEB/TFP/WJB/JHM/ch

cc: U.S. Nuclear Regulatory Commission

611 Ryan Plaza Drive, Suite 1000
Arlington, TX 76011

NRC Resident Inspector
P.O. Box 1051
St. Francisville, LA 70775

INPO Records Center
1100 Circle 75 Parkway
Atlanta, GA 30339-3064

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